



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

LAURA H. THIELEN
CHAIRPERSON
WILLIAM D. BALFOUR, JR.
SUMNER ERDMAN
NEAL S. FUJIWARA
CHIYOME L. FUKINO, M.D.
DONNA FAY K. KIYOSAKI, P.E.
LAWRENCE H. MIIKE, M.D., J.D.

KEN C. KAWAHARA, P.E.
DEPUTY DIRECTOR

STAFF SUBMITTAL

for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT

September 24, 2009
Honolulu, Hawaii

Request to Enter into a Cooperative Agreement with U.S. Geological Survey
For Statewide Hydrologic Data Collection and Water Resource Monitoring
For the First Quarter of the Federal Fiscal Year (FFY) 2010 and to
Delegate to the Chairperson the Authority to Approve
Quarterly Extensions of the Agreement up to September 30, 2010

Each year the Commission on Water Resource Management (CWRM) enters into a cooperative agreement with the U.S. Geological Survey (USGS) for the inventory and investigation of Hawaii's water resources.

BACKGROUND

The cooperative agreement between the USGS and the State officially began in 1909 when the USGS entered into an agreement with the Territory of Hawaii, and at its inception, the cooperative agreement was focused mainly on surface water. Initially only 12 streams were being gaged continuously. By 1914 there were 87 continuous-record stations. The program continued to grow, reaching its peak in 1966 when 197 gages were operational under the agreement. Over the years, some gages were discontinued for a variety of reasons, which include shifting fiscal priorities, changing economic realities, completed data acquisition objectives, and dwindling partnership engagement in monitoring and data collection.

In 1972, ground water data collection became an integral part of the agreement and began establishing the baseline data throughout the State with 170 observation wells. For reasons similar to the surface water gages, observation well data recording has steadily declined over the years such that only 17 well sites now remain to provide data continuity in FFY 2010.

Beginning in 1998, CWRM streamlined the cooperative agreement by transferring the crest-stage stream-gaging program to civil defense agencies where these data (e.g. flooding issues) are more relevant to disaster response rather than sustainability issues, and by eliminating duplication of ground water data collection efforts in wells. Ground water data gathering changed and expanded to incorporate the data provided by water system purveyors and well owners, who were required by law and rule to report their water-use and ground water and chloride levels.

Partnership with the Division of Forestry and Wildlife's (DOFAW) through its Watershed Management Grant Program (WMGP) had boosted the operation of gaging stations on watershed partnership lands. However, in these challenging economic times, the WMGP has withdrawn its support to gaging operations in watershed management areas, disengaging the watershed partnerships from CWRM and USGS efforts in monitoring the water resources in watershed areas. Meanwhile, the Waiahole Trust Fund helps defray the cost of monitoring the Waiahole Ditch system and its sources. Exhibit 1 provides a summary of changes to the program, including the operational cost, since FFY 2000.

CURRENT AGREEMENT

Although the nature of the agreement and the relationship of the parties involved are fundamentally unchanged, the fiscal situation and program implementation of the FFY 2010 agreement are markedly different from the FFY 2009 agreement. Notable changes from the previous agreement are as follows:

- program implementation in the first quarter of FFY 2010 with possible extensions
- quarterly extensions of the agreement up to September 30, 2010 are subject to the availability of funds and approval by the Chairperson
- general fund restriction (\$48,254)
- withdrawal of watershed management grant program support (\$48,896)
- elimination of sixteen monitoring sites
- USGS operational cost increases by about 4.5%
- reduction of monitoring frequency on sites that are not wired to a real-time network

Under the Joint Funding Cooperative Agreement for FFY 2010 (Exhibit 2), the USGS collects basic hydrologic data and provides data summary reports. However, the changes in the budget scenario have corresponding implications in the quantity and quality of hydrological data collection. The most noticeable impact in FFY 2010 cooperative program is the discontinuation of monitoring activities at sixteen gaging sites (Exhibit 3).

The table below summarizes the annual changes in funding requirements for this cooperative agreement.

COST	FFY 2008	FFY 2009	FFY 2010
Total Joint Funding Requirement	\$919,800	\$837,334	\$718,400
Expected (full-year) CWRM cost-share	\$526,600	\$504,000	\$405,500
Percentage CWRM cost-share	57%	60%	56%
DOFAW Watershed Management Grant	\$118,175	\$48,896	\$0
Waiahole Ditch Monitoring Fund	\$41,040	\$48,896	\$50,500
Ground water well continuous monitoring	\$5,400	\$5,730	\$6,000
Rain gage continuous recording	\$7,200	\$9,168	\$9,600
Continuous recording stream gage	\$18,000	\$19,100	\$20,000

Due to the State's fiscal situation, the current budget execution policy is to provide agencies with quarterly allocation of their FY2010 operating budgets. Allocations for subsequent quarters will

be made upon further consideration of State revenues and expenditure requirements, allowing for more definitive revenue forecast to become available during the course of the fiscal year. Therefore, under the subject cooperative agreement, the period of performance starts with the first quarter of the FFY 2010 with the state share of \$101,375 to the cost of monitoring the stations specified in Exhibit 3. With possible continuation to the end of FFY 2010, the Commission's share of the cooperative program should not exceed \$405,500. In light of the current fiscal challenges, the Commission staff is seeking greater flexibility to fund this cooperative program from general fund sources, the Waiahole Trust Fund, the water resource management special fund, or a combination thereof. This will enable staff to allocate funding towards this program which is fiscally advantageous in consideration of funding other Commission programs and activities.

RECOMMENDATIONS

1. Staff recommends that the Commission authorize the Chairperson to enter into a cooperative agreement with the U.S. Geological Survey in FFY 2010 to undertake the specified monitoring activities covering the period of October 1, 2009 to December 31, 2009 with possible continuation of the hydrological data collection program after December 31, 2009, subject to the availability of funds, but not to exceed \$101,375 per three-month period of monitoring.
2. The staff also recommends that the Commission delegate to the Chairperson the authority to extend this agreement and approve future monitoring activities, but not to extend beyond September 30, 2010.

The terms of this agreement will be subject to the approval of the Department's Deputy Attorney General. Contract execution will be done in accordance with Chapter 103D, HRS, and Chapter 3-122, Hawaii Administrative Rules.

Respectfully submitted,



KEN C. KAWAHARA
Deputy Director

- Exhibits
- 1 Summary of Changes to the Cooperative Program: 2000-2010
 - 2 Joint Funding Agreement for Federal FY 2010
 - 3 USGS Letter of Proposal for the Continuation of Cooperative Water Program to Federal FY 2010

APPROVED FOR SUBMITTAL:



LAURA H. THIELEN
Chairperson

EXHIBIT 1

SUMMARY OF CHANGES TO THE COOPERATIVE PROGRAM: 2000 to 2010

Federal Fiscal Year	No. of Stream Gages	No. of Wells Ground Water	No. of Rain Gages	CWRM Share \$	Changes
2000	87	157	32	\$415,175	FFY 2000 Changes: Refer to Staff Submittal dated December 14, 1999.
2001	89	120	32	\$440,000	FY 2001 Changes: Refer to Staff Submittal dated January 24, 2001
2002	54	120	30	\$415,000	1. Discontinuation of two rain gages: 2. Discontinuation of one continuous-record stream gage. 3. Addition of a continuous-record stream gage on Hakipuu Stream, Oahu. 4. Addition of low-flow measurements and seepage runs on selected Windward Oahu Streams.
2003	55	81	30	\$415,000	1. Start of operation of Hakipuu continuous stream gage. 2. Discontinuation of all chloride sampling at pumping wells to avoid duplication with the legal reporting requirements of well users and water purveyors.
2004	39	71	25*	\$373,000	1. Elimination of 4 continuous stream gages, 11 wells for collecting water level data, and 4 rain gages. 2. Utilization of low-flow streamflow data collected in FY03 to analyze pre-diversion flows in the Waiahole Stream area.
2005	25	70	21	\$356,000	1. \$42,000 budgetary reduction, though \$25,000 provided by DAR LNR 401 funds for Waiahole related gages. 2. DOFAW (NARS) funds 13 stream gages and 4 rain gages.

EXHIBIT 1

Federal Fiscal Year	No. of Stream Gages	No. of Wells Ground Water	No. of Rain Gages	CWRM Contribution \$	Changes and Comments
2006	25	56	21	\$342,740	<ol style="list-style-type: none"> DAR LNR 401 funds for \$25,000 to provide data analysis of stream flow statistics statewide. Waiahole Trust Fund provided \$35,000 for Waiahole stream-gages, and stream statistic in Waiahole. Kauai County to enter into their own cooperative agreement with USGS for wells owned by them.
2007	32	31	22	\$459,020	<ol style="list-style-type: none"> Prices increased by 31%. Addition of \$132,000 from the Watershed Management Grant Program. Waiahole Trust Fund provided \$42,713 for Waiahole gages.
2008	32	34	21	\$526,600	<ol style="list-style-type: none"> Prices increased by 7.5 %. Addition of \$118,175 from the Watershed Management Grant Program. Waiahole Trust Fund provided \$41,040 for Waiahole gages
2009	27	26	18	\$504,000	<ol style="list-style-type: none"> Prices increased by 10.3%. Watershed Management Grant Program support was reduced to \$48,896 Waiahole Trust Fund to provide \$48,000 for Waiahole gages General Fund budget cut amounting to \$45,547
2010	25	17	14	\$405,500	<ol style="list-style-type: none"> Quarterly implementation of the agreement General Fund restriction by \$48,254 Watershed Management Grant Program withdraws support Waiahole Trust Fund to provide \$50,500 for Waiahole sites USGS monitoring cost increased by about 4.5%. Reduction of site visits to lower the cost of monitoring

[EXHIBIT 2]

JOINT FUNDING AGREEMENT

THIS JOINT FUNDING AGREEMENT made and entered this ____ day of October, 2009, by and between the STATE OF HAWAII, through its Department of Land and Natural Resources, Commission on Water Resource Management, hereinafter referred to as the "STATE", and GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR, hereinafter referred to as "USGS".

WHEREAS, for and in consideration of mutual promises, the parties agree, subject to the availability of State and Federal funding and in accordance with their respective authorizations, to undertake a cooperative Joint Funding Agreement for the collection of hydrologic data in the State of Hawaii, hereinafter referred to as the "PROGRAM".

WHEREAS, USGS's authority to act under this agreement is 43 USC 36C, 43 USC 50, and 43 USC 50.

WHEREAS, the State's authority to act under this agreement is §174C-5, Hawaii Revised Statutes.

WHEREAS, the State, in consideration thereof, agrees to pay the USGS such amount as is hereinafter specified.

NOW THEREFORE, in consideration of the mutual promises set forth in this JOINT FUNDING AGREEMENT, the parties mutually agree to the following:

1. USGS agrees to perform the program according to the scope of work provided in Attachment 1.
2. The agreement period for the Joint Funding Agreement is provided in Attachment 2. Time is of the essence in this agreement. Any delay in the progress of the work, which may adversely affect the completion of the work under the agreement within the required time, shall be promptly reported in writing by the USGS to the State. The parties may agree to an extension of any deadline set forth in Attachment 2 provided that such agreement is in writing and signed by both parties, as set forth in Attachment 2.
3. The following amounts shall be contributed to cover all the cost of the necessary field and analytical work directly related to the program.
 - a) \$78,225 per quarter or up to \$312,900 for a full-year program by the USGS during the period of agreement from October 1, 2009 to September 30, 2010.

- b) \$101,375 per quarter or up to \$405,500 for a full-year program by the STATE during the period of agreement from October 1, 2009 to September 30, 2010.
 - c) Any addition or reduction of the contributed amount during the agreement period may be determined by a mutual agreement of the parties. Any additional work beyond that which is required under this agreement shall be done only upon a mutual agreement of the parties as evidenced in writing. The State will not be liable for the payment for any additional work that is not mutually agreed upon in writing by the parties.
4. The Chairperson of the Department of Land and Natural Resources, through the Deputy Director to the Commission on Water Resource Management, acting either directly or through their duly authorized representatives or subordinates, hereinafter referred to as "Chairperson", and the Director of the USGS Pacific Islands Water Science Center, United States Department of the Interior, acting either directly or through his duly authorized representatives or subordinates, hereinafter referred to as "Center Director", shall mutually resolve all questions regarding the manner of performance and progress of work in compliance with the agreement provisions, compensation, and any other questions which may arise under this agreement.
 5. If the work under this Joint Funding Agreement is not being carried out in a mutually satisfactory manner, either party may terminate this Joint Funding Agreement upon 60-calendar days written notice to the other party. Both parties shall use their best efforts to resolve disputes cooperatively, which best efforts may include, if both parties agree, the use of alternative dispute resolution, prior to any notice of termination. If the State terminates the agreement, the USGS shall immediately comply and suspend all work under the Joint Funding Agreement within 60-calendar days after receiving written notice from the State. Upon termination of the Joint Funding Agreement, the USGS shall, within 60-calendar days after the effective date of such termination, compile and submit in an orderly manner to the State an accounting of the work performed up to the effective date of termination. The USGS shall be paid for the work performed or services rendered as of the effective date of termination in the ratio that the amount of work completed as of the effective date of termination bears to the total amount of work to be provided herein.
 6. The parties shall permit the other party to review and inspect all field and analytical work done pursuant to this Joint Funding Agreement. The original records resulting from this program will reside in the office of origin for those records. Upon request, and at no charge to the other party, copies of the original records will be provided to the other party.

7. The maps, data, and reports resulting from this program shall be made available as promptly as possible. The maps, data, and reports will normally be hosted and published by USGS. The State reserves the right to host and publish the maps, data, and reports resulting from the program and USGS shall, upon request of the State, furnish to the State all maps, data, and reports in a suitable format to be reproduced, hosted on the web, and published. The maps, data, and reports published by either party shall contain a readable statement and visually recognizable symbol of the cooperative relations between the parties.
8. The payment and compensation schedule is set forth in Attachment 3.
9. Any amendment of this Joint Funding Agreement must be in writing and signed by both parties.

IN WITNESS WHEREOF, the parties hereto have caused this Joint Funding Agreement to be executed as of the day and year first above written.

STATE OF HAWAII

By: _____
Laura H. Thielen
Chairperson, Department of Land and
Natural Resources

GEOLOGICAL SURVEY
U.S. DEPARTMENT OF THE INTERIOR

By: _____
Gordon Tribble, Center Director

APPROVED AS TO FORM:

By: _____
Deputy Attorney General

SCOPE OF SERVICES

1. This Joint Funding Agreement is a continuation of the joint funding agreement for the collection of hydrological data in the State of Hawaii between the U.S. Geological Survey, United States Department of the Interior and the Commission on Water Resource Management, Department of Land and Natural Resources, State of Hawaii.
2. The scope of services involves the collection and computation of data on water resources collected in multiple locations throughout the State of Hawaii.
3. U.S. Geological Survey shall collect data at an agreed upon list of surface water stations, ground water monitoring stations, and rainfall stations, as set forth in Exhibit 3 which is attached hereto and incorporated by reference.
4. U.S. Geological Survey shall provide data summary reports and review of historical data sets.
5. U.S. Geological Survey shall host the maps, data, and reports resulting from this program in a publicly-accessible website, and shall provide the Commission staff direct and easy access to acquire, download, or transfer the data and report from a USGS server. The parties shall use good faith efforts to resolve any disagreements in the scope and validation of data acquisition and the contents of the report.
6. U.S. Geological Survey shall provide a readable statement of cooperative relations and visually identifiable symbol of the Commission as a cooperator in print, digital, and online publications of the data and reports of the monitoring stations that are included in the current cooperative program, and as well as the stations that were historically supported and funded by the Commission.
7. At least quarterly and upon request by the Commission on Water Resource Management, the U.S. Geological Survey will update the Commission on the progress of its work on this Joint Funding Agreement.
8. The Commission on Water Resource Management shall assist the U.S. Geological Survey in its work under the Joint Funding Agreement to the extent feasible and practicable under existing resources of the Commission.

TIME OF PERFORMANCE

1. The time of performance for this cooperative agreement is from October 1, 2009 to December 31, 2009. The cooperative agreement may be extended for 3 additional three month periods. In no event shall the time of performance pursuant to this agreement extend beyond September 30, 2010.
2. Extensions of this agreement during Federal FY2010 may be granted by the Chairperson of the Commission, subject to the availability of funds. Any extensions of the time of performance shall be in writing and signed by the Chairperson and the USGS.

COMPENSATION AND PAYMENT SCHEDULE

1. Payment by the State shall be made every three months upon satisfactory completion of the data acquisition, progress report, and billing by the USGS. Billing shall be based upon the State's share of the total program cost and shall not exceed \$101,375 for each three month period. The State's share of the program costs, should this agreement be extended to cover a full one year period, shall not exceed \$405,500 (56%) of the total cooperative program cost of \$718,400 for Federal FY2010. Payment shall be made within sixty days after the billing date unless otherwise mutually agreed to by the parties.
2. State shall retain 5% of the total amount of the State's share of the total program cost until the data becomes available and accessible and the scope of work has been satisfactorily completed.



United States Department of the Interior

U.S. GEOLOGICAL SURVEY

Pacific Islands Water Science Center

677 Ala Moana Blvd., Suite 415

Honolulu, HI 96813

Phone: (808) 587-2400/Fax: (808) 587-2401

July 20, 2009

Mr. Ken C. Kawahara, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P.O. Box 621
Honolulu, HI 96809

Dear Mr. Kawahara:

Subject: Cooperative hydrologic data-collection and analysis program, Federal fiscal year 2010

This letter proposes the continuation of the State Commission on Water Resource Management (CWRM)-U.S. Geological Survey (USGS) Cooperative Water Program to collect hydrologic data in the State of Hawaii during Federal fiscal year 2010 (October 1, 2009 through September 30, 2010). The total cost of the program will be \$718,400 of which \$405,500 will be provided by the CWRM and \$312,900 will be provided by the USGS. The number of stations and associated costs for the program in Federal fiscal year 2010 is provided below, and a complete list of the stations is attached to this letter:

Station Type	Number	Unit cost	Total
Surface water gages	25	20,000	500,000
Pearl Harbor Spring flow	21 sites –once per year		23,000
Well water level – periodic- quarterly	11	3,500	38,500
Well water level - periodic	1	4,000	4,000
Well level - continuous	1	6,000	6,000
Well level (periodic) & QW	4	variable	12,500
Rain	14	9,600	134,400
TOTAL			\$718,400

The number of stations to be operated under the CWRM-USGS Cooperative Water Program is significantly reduced from that operated in Federal fiscal year 2009, and includes elimination of the following sites:

<u>Type</u>	<u>Island</u>	<u>USGS Station Name</u>	<u>USGS Station No.</u>	<u>Cost</u>
Well - WL	Kauai	2-5426-03 Koloa	215434159263301	4,000
Well - WL	Kauai	2-0021 Kalepa Ridge	220057159210301	4,000
Well - WL Cont.	Kauai	2-5923-08 Hanamaulu Monitor	215950159231601	6,000
Well - WL	Oahu	3-3251-02 Kaaawa Shaft	213242157510201	4,000
Well - WL	Oahu	3-2703-02 Kunia Basal Monitor	212738158034301	4,000
Well - WL	Oahu	3-3407-37 Kiikii	213430158071601	4,000
Well - WL	Molokai	4-0449-01 Ualapue	210402156495801	4,000
Well - WL	Molokai	4-0457-01 Kawela Shaft	210419156570501	4,000
Well - WL	Maui	6-4824-01 Kihei Exploratory	204827156242201	4,000
Well - WL	Maui	6-5130-02 Waikapu 2	205154156303801	4,000
Rain	Kauai	1045.0 Waialeale Trail near Lihue	220504159321401	9,600
Rain	Kauai	1085.0 Mohihi-Koaie Divide	220703159351201	9,600
Rain	Oahu	882.4 Poamoho No. 2	213211157562400	9,600
Rain	Maui	297.0 Olowalu	204923156371501	9,600
Stream	Oahu	Kaluanui Stream near Punaluu	16304200	20,000
Stream	Oahu	Makawao Stream near Kailua	16254000	20,000

Other changes to the program include reducing water-level measurements to one per quarter for non-continuous recording groundwater sites (except 3-2256-10 Aiea Navy 187-B which is reduced from a continuous monitoring site to a periodic measurement site) and reducing the Pearl Harbor Springs sampling from twice per year to once per year. The Maui Department of Water Supply has agreed to pick up \$2,000 of the cost of the 6-5430-05 Waiehu Deep Monitoring well and to pay for the water-level portion of the 4-0800-01 Kualapuu Deep monitoring well on Molokai. Water-quality profile work for Waiehu Deep Monitoring well is reduced from quarterly to twice per year.

Fully funding all of the stations operated in Federal fiscal year 2009 would require a total of \$883,800, including \$525,900 in State funds. It is my hope that funds from either other local agencies or Federal sources can be found to prevent at least some of these stations from being discontinued.

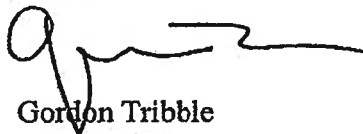
I note that this reduction accelerates a long-term decline in the number of stations where water resource information is collected in Hawaii. Although the reduction in the program is a consequence of current economic conditions, it must be noted that we have reached the point where we are losing our ability to assess hydrologic conditions and provide essential water resource information for the State. Unless alternate sources of funding can be identified to reverse this trend, within a few years the State will find itself without adequate hydrologic information to address the complex issues of a growing population, changing climate, and conflicts over water allocation.

The 4.7% cost increase from the previous year reflects actual costs we incurred to replace aging infrastructure and vehicles. Historically, we undercharged the operation cost so needed gage maintenance did not get done. Much of our vehicle fleet is 10 to 15 years old and many of these vehicles are unsafe. The costs we charge reflect the actual costs to do the work. As a Federal agency, the USGS obtains no profit from any of the work we undertake.

The legal authority for the USGS to enter into this program is 43 USC 36C, 43 USC 50, and 43 USC 50b. Work performed with funds from this program will be conducted on a fixed-price basis. This means that invoices will be based on the agreed-upon amount, rather than actual itemized expenses. Your agency will be billed using Form DI-1040. The results of all work under this program will be available for publication by the USGS.

If you are in agreement with this program, please submit an updated Memorandum of Agreement by September 30, 2009, or at your earliest convenience. If you have any questions concerning this program, please feel free to contact me at 587-2405.

Sincerely,

A handwritten signature in black ink, appearing to read 'Gordon Tribble', with a stylized flourish at the end.

Gordon Tribble
Center Director

Attachment

Attachment – Stations proposed to be operated by USGS as part of the Federal Fiscal Year 2010 cooperative data program between CWRM and USGS.

<u>USGS Station Number</u>	<u>Island</u>	<u>USGS Station Name</u>	<u>Station Type</u>
215901159235301	Kauai	5923-01 Kilohana W-A	GW WL-1/4
215607159344301	Kauai	5634-01 Hanapepe Ridge	GW WL-Cont
212154158015201	Oahu	2101-03 Honolulu	GW WL-1/4
213438158091101	Oahu	3409-16 Mokuleia	GW WL-1/4
211832157515501	Oahu	1851-19 Halekauwila Street, Pipe A	GW WL+QW
211832157515502	Oahu	1851-19 Halekauwila Street, Pipe B	GW WL+QW
212238157561101	Oahu	2256-10 Alea US Navy, (187-B)	GW WL
210825157004301	Molokai	0800-01 Kualapuu Deep Monitor	QW profile
205140156304501	Maui	5130-01 Waikapu 1	GW WL-1/4
205312156321402	Maui	5332-04 Kepaniwai Observation	GW WL-1/4
205617156311101	Maui	5631-01 TH-A1 Waihee	GW WL-1/4
205433156184101	Maui	5418-01 EMWDP Monitor	GW WL-1/4
205437156310501	Maui	5431-01 TH-B Waihehu	GW WL-1/4
205405156305401	Maui	5430-05 Waihehu Deep Monitor	QW profile/GW WL
190423156371501	Hawaii	0437-01 Waiholinu	GW WL-1/4
193251155072101	Hawaii	3207-04 Mt. View	GW WL-1/4
200132155471101	Hawaii	6147-01 Kawaihae W-3	GW WL-1/4
220356159281401	Kauai	1051.0 N. Wailua Ditch near Lihue	RF
220713159361201	Kauai	1083.0 Mohihi Crossing near Waimea	RF
220739159373001	Kauai	1082.0 Waiakoali near Waimea	RF
220927159355001	Kauai	1084.0 Kilohana near Hanalei	RF
212359157502601	Oahu	772.3 Moanalua No.1 at alt. 1,000 ft	RF
212855157504501	Oahu	837.0 Waihole at Kamehameha Hwy.	RF
213215157552800	Oahu	883.12 Poamoho No. 1 near Wahiawa	RF
213237157530701	Oahu	886.4 Kahana at alt. 95 ft.	RF
213608158011101	Oahu	897.9 Pupukea Road at alt. 1,160 ft.	RF
213732158010201	Oahu	897.11 Kamananui at alt. 720 ft.	RF
203721156151601	Maui	255.0 Kepuni Gulch	RF
194117155174801	Hawaii	83.0 Quarry at Saddle Road	RF
194945155534402	Hawaii	92.5 Kiholo	RF
200518155405801	Hawaii	185.7 Kawainui near Kamuela	RF
16010000	Kauai	Kawaikoi Stream near Waimea	SW-Cont
16060000	Kauai	South Fork Wailua River near Lihue	SW-Cont
16068000	Kauai	East Branch of North Fork Wailua River near Lihue	SW-Cont
16097500	Kauai	Halaulani Stream at alt. 400 ft. near Kilauea	SW-Cont
16103000	Kauai	Hanalei River near Hanalei	SW-Cont
16049000	Kauai	Hanapepe River below Manuahi Stream near Elele	SW-Cont
16345000	Oahu	Opaeha Stream near Wahiawa	SW-Cont
16229000	Oahu	Kalihi Stream near Honolulu	SW-Cont
16240500	Oahu	Waiakeakua Stream at Honolulu	SW-Cont
16294900	Oahu	Waikane Stream at alt 75 ft. at Waikane	SW-Cont
16200000	Oahu	North Fork Kaukonahua Stream above Right Branch	SW-Cont
16213000	Oahu	Waialeale Stream at Waipahu	SW-Cont
16296500	Oahu	Kahana Str at alt. 30 ft. near Kahana	SW-Cont

16294100	Oahu	Walahole Stream above Kamehameha Hwy.	SW-Cont
16604500	Maul	Iao Stream at Kepaniwai Park near Wailuku	SW-Cont
16508000	Maul	Hanawi Stream near Nahiku	SW-Cont
16614000	Maul	Waihee River above Waihee Ditch Intake near Waihee	SW-Cont
16620000	Maul	Honokohau Stream near Honokohau	SW-Cont
16518000	Maul	West Wailuaiki Stream near Keanae	SW-Cont
16587000	Maul	Honopou Stream near Huelo	SW-Cont
16720000	Hawaii	Kawalnui Stream near Kamuela	SW-Cont
16717000	Hawaii	Honolii Stream near Papaikou	SW-Cont
16770500	Hawaii	Paaauu Gulch at Pahala	SW-Cont
16704000	Hawaii	Wailuku River at Piihonua	SW Cont
16725000	Hawaii	Alakahi Stream near Kamuela	SW Cont